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The Seeing Factors in Traffic Safety*

James E. Lebensohn, M.D.

Chicago, Illinois

THE author emphasizes the need for adequate vision testing in licensing drivers, and points out that good vision and visibility especially at night are essential for traffic safety.

A driver's license is now mandatory throughout the Union, although Kansas, Missouri, and South Dakota require no examination, visual or otherwise. The latest survey of state requirements for motor vehicle operators—annually published by the American Optical Company—still shows a lamentable diversity in almost every item. However, voluntary uniformity is gaining ground, as already evidenced by the increasing similarity in signals, signs, and road markers. The eligible age for acquiring a driver's license varies from 18 years in New York, Pennsylvania, and Vermont to 14 years in North Dakota, New Mexico, and South Carolina.

The Motor Vehicle Driver

There are 50,000,000 drivers now licensed in the United States. Six million are examined annually. Re-examination for renewal is required only in Colorado, Iowa, and North Carolina.

The requirement for corrected visual acuity is 20/20 in South Carolina; 20/60 in Illinois, Nevada, and West Virginia; and 20/70 in Massachusetts and Maryland. The one-eyed driver is accepted everywhere if his seeing eye has a full field and a corrected acuity of 20/20 (Texas, Alabama) to 20/70 (Massachusetts). No state yet tests for night vision or glare resistance. In several states drivers are restricted to daylight hours if their deficient acuity is not ade-

* From the Department of Ophthalmology, Northwestern University Medical School, Chicago, Illinois.

quately correctible, but the discriminatory level varies from 20/100 in Maryland to 20/70 in Oregon and 20/50 in Pennsylvania.

Visual screening tests that will gain official approval must be performed rapidly, with relatively simple and inexpensive apparatus, by lay personnel of limited training. In some states (Minnesota, Florida, and California) the applicant who fails is given a record blank and referred for further investigation to a "visual specialist" (ophthalmologist or optometrist) of his own choice. In Florida, where 20/50 acuity is passing, 15,000 of the 200,000 applicants for driver's license in 1947 were referred for visual examination. Eventually the visual tests for drivers should be as significant for the adult population as the screening tests in schools are for children.

Corrective Glasses Important.—The Driving Research Laboratory of Iowa State College states that 60 per cent of the general adult population require glasses, but only 30 per cent are using them; and of the glasses worn 30 per cent were no longer correct at the time of examination. Uncorrectible poor vision is present in 5 per cent. Of 889 truck drivers checked by the U.S. Public Health Service in 1941, only 45 per cent had 20/20 acuity in each eye, but just 8 per cent were wearing glasses.

The American Association of Motor Vehicle Administrators recommends that the driver's license of those requiring glasses be stamped: "Must wear corrective glasses while driving." The word "corrective" is stressed because, otherwise, plain or sunglasses would technically meet the requirement.

Education should emphasize the trifling disadvantages of glasses compared to the signal importance of reading signs and markers easily and quickly. The average stopping distance on dry pavement for a car at 60 miles per hour is about 200 feet, and the average traffic sign can be read at 225 feet if the visual acuity is 20/20. With lesser acuity this distance is reduced proportionately. The reading of signs stimulates both the attention and the visual outlook. A driver is able to perceive an unexpected obstacle only half as far away as he can see an expected one. The National Safety Council recommends that glasses be worn if binocular vision is less than 20/40; in monocular vision, 20/30 is the suggested minimum.

In the past two years America has had the lowest annual mileage death rate in its history but motor vehicle accidents still rate tenth

among the leading causes of death. In 1947, the total of traffic deaths in the nation was 32,000, averaging 8.6 deaths per 100 million miles of travel, being about twice as heavy in the rural areas as in the cities. One fifth of the road accidents involved children, being highest in the age group of 5 to 6 years. The lowest mileage death rates—4.3 and 4.7 per 100 million miles, respectively—were reported in Connecticut and Rhode Island. In both states the minimum acceptable acuity is 20/40.

Other Visual Limitations.—Although it is known that 15 per cent of the drivers are responsible for 90 per cent of accidents, the factors responsible for accident proneness still require critical evaluation. Deficiencies in dark adaptation, field of vision, eye-hand and eye-foot coordination are all more significant than central visual acuity. The macular vision of accident-prone drivers does not differ from that of the average driver. Many drivers with only 20/200 vision have had no accidents in 20 years of driving. Since most hazards are very large, the perception of contrast is probably of more value than simple acuity.

The American Association of Motor Vehicle Administrators feels that most drivers with substandard vision can be allowed the privilege of doing the kind of driving they are able to do in reasonable safety; but they should be restricted to daylight hours, limited speed, or a certain class of roads.

Rarely is a person so color blind that he cannot distinguish between red and green traffic lights. Besides the brightness difference, the standard position (from above down) of red, yellow, and green is an additional clue that allows most drivers to overcome their color deficiency. The "red and green" traffic lights are usually yellow-red and blue-green and these yellow and blue components also aid differentiation. In fact the color blind are less confused by the red and green lights than by the red and amber.

To the ophthalmic specialty belongs the task of determining the amount and quality of vision needed to be a safe driver and to improve, simplify, and standardize the screening tests required. For the rating of visual acuity, standardized illumination should be provided, and an unlearnable letter chart, as has been used in the U. S. Navy, is probably more suitable and effective than the Snellen refraction chart now in vogue. Visual field tests may be restricted

for the sake of time to the horizontal meridian since that is the angle most important in driving. Simplified tests for night vision and glare resistance are urgently needed.

More important for traffic safety than skillful driving and adequate visual capacity is a sense of social responsibility. Greater pride should be taken in being a safe driver than a fast one. The 16 to 20 year-old group is involved in five times as many accidents as those aged between 45 and 50 years.

Night Driving

Motor vehicle fatalities have increased steadily with the travel mileage, the present toll being over 32,000 deaths annually. Night accidents are twice as likely to be fatal as those of the day, the deaths per accident being respectively 1 to 26 and 1 to 49. The fatal accident rate per mile at night is three times that of the day. Although only one third of the driving is done at night, two thirds of the traffic deaths occur then. Motor vehicles cause more loss of life among other road users than among their own occupants. Of the pedestrians, 70 per cent were killed at night.

Special Visual Factors.—The three most important visual factors involved in night driving are: (1) discrimination under conditions of poor illumination; (2) ability to see against glare; and (3) recovery from glare. Tests designed to test these faculties should be simplified and adapted for the driver's examination. Tests for glare resistance measure the ability to distinguish a dimly illuminated object when bright lights are shining in the eyes at various angles. To test glare recovery the adapted eyes are first checked for discernment of a dimly illuminated object, then exposed to a glaring light for 30 seconds, after which the interval is noted before the dimly illuminated object can again be perceived.

Signals composed of reflector buttons, five-eighths inch in diameter, are visible at 1,000 feet. The return beam from the headlight does not exceed 0.000,001 footcandle at this distance. At a driver's eye level the high beam of an oncoming car gives 1.0 footcandle. The pupils contract within one second, but require seven seconds to fully redilate, and one minute for adequate readaptation. The effect of glare in reducing peripheral vision depends on how greatly the glare light contrasts in intensity with the general illumi-

nation and its angle of incidence. The effect at one degree from the line of vision is over three times that produced at five degrees. Hence shifting the gaze down to the right edge of the road materially reduces the glare effect. Likewise, when the opposing headlight beam is depressed, the light seen is reduced from 1 footcandle to 0.2 footcandle, and the glare effect is proportionately less.

The prime reason for the excess of night accidents is inadequate vision. A shorter sight distance results and, because of unreliable visual clues, errors in the judgment of distance and speed occur. As the illumination lessens, the field of vision decreases, especially when fatigue develops. About 75 per cent of accidents have involved objects in the peripheral field. Since a visual deficiency in daylight is even more significant at night, the one-eyed person or one with corrected acuity below 20/40 should be cautioned especially against night driving. Motorists with only one efficient eye, which includes 1 to 2 per cent of all drivers, are much inferior to the binocular sighted in night vision, glare resistance, and recovery from glare. A similar deterioration, though without loss of acuity, often affects the aged, due to the fact that the rigid iris does not dilate adequately or that the media are less transparent to the rays most sensitive to the dark-adapted retina. Fatigue from night driving prolongs the glare recovery time, and the accident-prone drivers often show a significant deficiency in dark adaptation.

Aids for Night Drivers.—The hazards of night driving can be reduced by improved highway lighting. This has been feasible only in congested areas, but two thirds of all accidents happen in the country. Accidents have occurred at speeds below 20 miles per hour so that it seems hardly possible to get the speed of vehicles down to a safety level. Polarized light to reduce glare is impracticable as the headlights would then require over four times the present power, and dust on the screens would modify the filtering effect.

But various simple measures are worth while. Light objects are discerned with only one fourth as much light as dark objects. When a light road surface in the environs of Philadelphia was changed to dark a marked increase in night accidents followed. Pedestrians should not only face the traffic in walking at night but should wear something white, if only a handkerchief, around the neck or arm.

Spectacles, although necessary, cause a loss in light transmissions. Tint aggravates the absorptive light loss and so any kind of tinted glass should be taboo after nightfall. In clear crown glass of 1.5 mm. center thickness only 0.6 per cent of light is absorbed. However, the loss from surface reflections is significant—4 per cent from each surface in crown glass, 6 per cent in flint glass. Moreover the reflections cause secondary images with consequent haze and reduction of image quality. The magnesium fluoride coating cancels almost completely the reflected light in flint glasses and considerably lessens the loss in crown glasses. On changing to thinlite coated lenses, the appearance of myopes is remarkably enhanced and a subjective improvement in vision is experienced, especially at night.

Glasses have been constructed that effectively lessen the disturbance from headlight glare. For the past year the Night Driving Lens Company of New Haven, Connecticut, has been making up the driver's distance prescription in a clear glass on which has been placed a small mirror shield just to the left of the pupillary margin in each eye. The shield is a thin front-surface mirror that permits clear vision through it. It is probably made of inconnel (an alloy of chrome, iron, and nickel) and is guaranteed to be harder and more resistant to wear than the glass itself. The mirror reflects the headlight glare and, at the same time, casts a protecting shadow across the pupil. Dr. W. J. Holmes, of Honolulu, who has been much concerned about the problems of night vision, and I have given these glasses a trial for the past six months and can confirm their value. The coated lens mitigates a different disturbance of night vision from the "silvo-flect" shield, but the two cannot be combined, as the magnesium fluoride coating cannot be successfully applied to the latter.

In prescribing special glasses for night driving, the oculist should recall that the greatest luminosity of the spectrum shifts from 555 millimicrons (yellow-green) in day vision to 510 millimicrons (green-blue) at night. The focus of the eyes changes accordingly so that the eye is functionally about 0.5D. more myopic in night vision. Consequently, to obtain the clearest vision at night a −0.5D. should be added algebraically to the regular distance prescription to compensate for the night myopia.

Night Lighting

Visual impressions register more slowly as the level of illumination drops. Consequently, nighttime motor accidents entail a severer toll in deaths, injuries and property damage, since the driver is allotted less time and space than in the daytime to avoid contact or reduce the force of impact. Per accident at night the bodily injuries are more serious and the property damage is 50 per cent higher than in daytime.

Night driving is being facilitated by more efficient headlights and more adequate illumination on streets and highways. In daylight an obstacle is distinguished by the detail revealed by its reflected light. Enough artificial light to allow such discernment is not generally practicable nor indeed necessary except for crowded business areas. Satisfactory visibility is secured if the background is brighter than the object (silhouette discernment), or if the object is brighter than the background (reverse silhouette). Adequate pavement brightness permits all important pavement details to be seen and renders silhouette discernment effective. Pavement brightness depends on the illumination and the pavement reflectance. The diffuse reflection factor of a ten-year-old concrete pavement is 22 per cent; of similar asphalt and brick pavement, only 7 per cent. The more reflecting surface gives a greater distance of road visibility. Pedestrians are the most important of obstacles, and the reflectance of their clothing ranges from 2 to 15 per cent, the average for men's being 5 per cent.

Headlamps.—When, in 1914, electric lighting was first applied to headlamps, the single all-purpose beam provided a compromise between road illumination and glare. The dual beam became necessary as operating speeds increased, and was introduced in 1930. The driving beam of 50,000 candle power allowed seeing at a sufficient distance to stop a car traveling 45 miles per hour in about 200 feet. This apparently fulfilled the requirements, since the motorists' line of sight usually centers at a point approximately 200 feet ahead of the car. But, because of the time factor in vision, decreased visibility accompanied further speed. For each increment of one mile per hour in speed, a driver perceives an unexpected obstacle at two feet less distance.

Since 1940 the driving beam produced by a pair of headlights has been increased to 75,000 candle power. The depressed beam for the reduction of glare now directs more light to the right edge of the road, which aids vision during the approach of another car. The reflector, filament and lens are aligned and hermetically sealed during manufacture to insure perfect and permanent focus. The "Sealed Beam Lamps," now in universal use, maintain almost their initial output throughout the life of the car. When driving in dense fog, the depressed beam must be used, as the layer of lighted fog between the roadway and the driver's eyes is then thinner and so causes less interference with seeing.

Fixed Lighting.—On city streets and on roads with high traffic density headlamp lighting alone is insufficient. Fixed lighting is necessary which should give a minimum value per square foot of street surface of 0.4 to 1.2 footcandles, according to the density of pedestrian and vehicular traffic. Controlled light direction is secured by the reflector type of pendant luminaire. Glare is avoided by raising the lamps high above the street level. The glare effect at the height of 20 feet is double that at 30 feet. The entrances of long tunnels must have supplementary lighting for daytime operation to avoid a too abrupt light change. At 25 feet from the tunnel entrance the illumination should be 100 footcandles; at 100 feet, 25 footcandles.

With the same amount of light similarly distributed, equal visibility is produced by sodium-vapor, mercury-vapor, and filament lamps. The filament lamp is best adapted for general use. It produces light of pleasing color and is available in a wide variety of sizes. Globes of clear rippled glass are preferable because of the low light absorption. Mercury-vapor lamps for street lighting are made in 250- and 500-watt sizes. Although costly to install, their high efficiency makes maintenance economical. The color contrasts well with the display lighting of business districts. In Los Angeles the obsolescent arc lamps on Broadway were recently replaced with 16,000 lumen mercury-vapor units. The new lighting gives the street 2 footcandles of light as compared with 0.31 footcandle of the old system at 20 per cent of the operating cost. Sodium-vapor lamps are only in 10,000 lumen units. This attention-getting light is especially good for underpasses, bridges, railroad crossings, sharp

curves, and dangerous intersections. The yellow light gives complexions an unnatural appearance and hence is not desirable for city streets. Sodium-vapor lamps are much more costly than equivalent filament globes but give nearly three times as much light per watt.

City lighting systems were originally designed for protection against robbery and other crimes; lighting to enhance business areas followed; but only lately has lighting for traffic safety become a goal. Since 1910 the expenditures for street lighting have gone up but 60 per cent, while the speed of cars has doubled and the traffic density has increased fivefold. The main traffic arteries in towns and cities, though one tenth of the total street mileage, account for half of all urban fatalities. The National Safety Council asserts that 35 per cent of all night traffic accidents are traceable to inadequate lighting. The over-all ratio of night to day fatalities has increased from 1:1 in 1930 to 1.4:1 at present due to the lag of night lighting in relation to the growth of traffic.

Need for Improved Lighting.—In Chicago a study in 1940 showed that 35 per cent of the total traffic fatalities occurred in 4.4 per cent of the total street mileage, and that more than 62 per cent of the fatalities occurred at night. After five dangerous intersections were provided with improved lighting, the total night accident rate dropped 37 per cent. In Detroit, in 1936, the average illumination on the main thoroughfares was 0.2 footcandle. When this was increased to 1.2 footcandles the ratio of night to day fatalities on these streets decreased from 6.9:1 to 1.4:1. Since November 1, 1946, when Indianapolis revised its prewar lighting, the annual night accidents on a typical busy street fell from 23 to 14. In Los Angeles the improved street lighting inaugurated in 1947 reduced night pedestrian fatalities by 33 per cent over the previous year. A decade of good lighting in Hartford, Connecticut, showed, in comparison with the previous decade, a reduction of 76 per cent in night fatalities, 78 per cent in pedestrian injuries, and 58 per cent in all types of accidents.

During the depression of 1932 Detroit reduced its lighting 35 per cent and, as a consequence, the proportion of night to day fatalities doubled. The cost of caring for the victims of traffic accidents more than exceeded the savings. In the dimout of 1942 the ratio of night

to day fatalities in New York City and Long Beach, California, rose from 1.33:1 to 2.15:1. In Connecticut the night accident rate that year increased 35 per cent.

Automobile accidents are brought about by a combination of circumstances, and the removal of one often results in avoiding the accident. The more certain seeing provided by good lighting reduces the accident quota previously attributed to inattention, carelessness, fatigue, speeding, or drunkenness. At minimum visibility drivers reacted to an unexpected obstacle at 20 to 80 per cent of the distance noted when warned of its presence. Hence a safety factor of 2 to 5 is required for the variation in driver attention alone. In reading with 10 footcandles, as compared with the minimum illumination necessary (0.1 footcandle), the safety factor is 100. In instruction signs on the road the color combinations chosen should be those seen best under minimal illumination, such as black on aluminum, white on dark green, black on yellow, or black on white.

Accidents preventable by good lighting cost the nation annually 10,000 lives and $187,000,000. Modernized lighting is expensive, but it can be had at half this dollar loss and would, moreover, expedite pedestrian and vehicular traffic, increase property values, reduce crime, and promote civic pride.

Psychosomatic Ophthalmology*

Henry L. Birge, M.D.

Hartford, Connecticut

PRESENTS examples of how mental or emotional states can bring about or be related to a variety of eye diseases or symptoms.

PSYCHOSOMATIC medicine is the modern term for what Osler called the "art of medicine." It is the art of understanding the patient's mind, and at the same time utilizing all the tools that modern medicine has put at our disposal for the cure of disease. Medicine has progressed far in the past 30 years, until we rightly feel that here in this country we have the best medicine the world has ever known.

In speaking of psychosomatic medicine some people erroneously emphasize the psychic aspects. It is a gross injustice to the patient and to the doctor to treat a patient's mind without carefully examining the body. For the physician to jump to the conclusion that all the patient's troubles are in his mind, without a careful examination, is poor medicine. A fundamental principle of psychosomatic medicine is a careful and exhaustive examination. Psychosomatic medicine is the combination of the best of our medical ability with an understanding of modern psychiatry.

Probably the earliest proponent of psychosomatic medicine was the elderly ophthalmologist who told the story of fitting glasses to a patient who saw spots before the eyes. This of course did the patient no good, for the next day she came back and told him: "Doctor, I see the spots better." It is not right to treat the mind without examining the body (or that organ in which the specialist is interested), nor is it right to treat the body without considering that the disease may be in the mind! Psychosomatic medicine

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means the diagnosis and treatment equally of that portion of that disease that is in the body and that portion that is in the mind.

Super-specialization has reached the acme of perfection in our day, with national boards of certification in everything, but the realization that each specialist must also consider the body as a whole has taken root throughout the nation. No longer is it possible to treat any part of the body adequately without consideration of the effects of the subconscious mind and emotion on the medical problem.

The subject of ophthalmo-psychosomology is divided into two parts: (1) ophthalmic psychoneuroses (simulated ocular disease); and (2) ophthalmopathy associated with psychoneuroses (ocular disease related to psychoneuroses).

There are always scoffers and disbelievers, and for them we start at the bottom. They say emotion cannot cause disease. We point to the common, ordinary "black eye." Emotion caused someone to swing a fist—and the black eye results. When the emotion that causes damage is within the *patient* the case becomes more complicated.

The Ophthalmic Psychoneuroses (Simulated Ocular Disease)

There are many forms of simulated eye disease, among them acute or chronic ocular anxiety neurosis, hysterical blindness, conversion hysteria, traumatic neuroses, malingering, hypochondriasis, as well as delusions and obsessions related to ocular manifestations of the major psychoses. The ocular anxiety neurosis is the most commonly seen of these conditions. It is manifested by an anxiety pattern of behavior, with ocular symptoms despite the fact that no ocular pathology or other pathology is present. The ocular symptoms consist of: (1) severe headaches that do not respond to aspirin; (2) visual loss, varying from a complete "blackout" to spots of varying sizes before the eyes; (3) ocular pains; (4) photophobia, burning, epiphora; (5) twitching of the lids; (6) dizziness, perspective distortion; and (7) easy fatigue.

To illustrate, consider the case of a young French woman:

The patient had dendritic keratitis. She was young and married, and had been doing well, with the slow improvement noted in

these cases. One day after having been seen by one of my associates who treated her in my absence, she developed an acute anxiety state. This occurred because of some unplanned remark that she would have a permanent scar on her cornea. In the next twelve hours she became so upset because her beauty would be smirched by the scar—she imagined a pearly white cornea, which is not a mark of beauty in any way—that she feared she would not be attractive any more. She envisioned her husband leaving her, and her world ruined. In the wee hours of the morning I was awakened by her husband, also in a state of acute anxiety. His wife had taken a handful of sleeping tablets. I recalled having prescribed ½ grain phenobarbital for her, and knew she had access to a good—if not fatal—dose of barbital. So I spent the night correcting my colleague's mistake in handling an ocular anxiety neurosis. As the case turned out, her corneal scar was nearly imperceptible and her vision some months later was 20/30 in that eye.

A typical case of ocular anxiety state is often an ocular emergency, and cannot wait a month for an appointment.

Another case is that of a 38-year-old woman:

The patient was a 38-year-old woman who complained of spots before left eye and failing vision in the past six weeks. She consulted an oculist who said he was unable to tell her the cause of the "spots" or scotoma. He studied her for several hours, spent long periods in the dark room, raising questions about the possibility of iris melanoma, and the patient became very upset. In fact she was in a state of acute anxiety, which was obvious. Further examination of subjective scotoma showed it to be larger at two meters than at four meters. After reassurance, all findings were normal. There was no defect of her field of vision. The fundus was normal and so was the tension. The diagnosis was ocular anxiety state, with no ocular disease, and the treatment consisted of reassurance, with follow-up when necessary.

These two cases, and countless others, illustrate fear. In pure neuroses there is no ocular disease, only simulated ocular disease. The differential diagnosis of a central scotoma, or any scotoma, includes ocular, as well as brain and neurologic disease, such as multiple sclerosis, and requires a thorough examination and careful consideration by the physician. Often consultations are required, and it is important to reassure the patient during these periods rather than to allow the psychoneurosis to become acute.

The following case illustrates an anxiety neurosis in a man:

L. T., aged 43, had a boyhood injury to the left eye which resulted in cataract formation. Gradually increasing visual difficulty with the right eye led him to seek an eye consultation. A thorough ophthalmological examination indicated the presence of the cataract in the left eye and the beginning of presbyopia in the right eye.

Worry over the cataract led to fear that his livelihood was threatened. The real cause of the visual difficulty was early presbyopia. This patient was not ready to undertake bifocals and so was given two pairs of glasses—one for distance and the other for reading. No surgery was advised because of the perfect vision in the right eye.

Hysterical Eye Manifestations

Dim vision, amaurosis, paralysis of accommodation, night blindness, tubular visual fields, and changes in color vision and fields in the absence of pathology that will explain the symptoms, may be due to hysteria. The following case history illustrates ocular hysteria in a twelve-year-old girl:

E. D., aged twelve, was referred because her own eye doctor found her eyes "in a state of change." She had been reported in school, and also by her piano teacher, to have poor vision. The poor vision developed in August, 1947. She had been examined three times in September, the month previous to her visit to me. Each time her vision had been different. Her doctor advised that she go without glasses, but her parents did not like this because, with the failing vision, there were days she could not read. Her visual fields were narrowed to 15° to 20° in each eye—practically tubular vision—for which no organic cause was found. Her visual acuity was 20/50, in both eyes, with glasses. After three months of treatment, her visual fields improved to normal. She had to go to school, but because of inability to read on some days was given +3.00 lenses for both eyes for use only when the visual failure occurred. When her vision was normal she needed no glasses, but in the periods of visual difficulty she could read with the +3.00 sphere. Her last examination in February, 1948, showed her cured—vision 100 per cent.

In this case the findings were reduced visual acuity which affected schooling; tubular visual fields; accommodative weakness; loss of fusion; and stereopsis, over a period of six months.

During this period, marked sweating of the feet occurred. It was so excessive that the mother noted the stockings could be

wrung out each night. This constant sweating of the feet led to a condition similar to "immersion foot." The child's feet became severely excoriated and she visited several physicians, coming at last to a chiropodist who cured the sweating of the feet and excoriation by the use of "*electrical*" treatments. Probably none of these people recognized the underlying hysteria as the basic problem. The ophthalmologist's problem was simple after examination of the field of vision. It was, however, complicated by the appearance of the child's head, which suggested some slow growing intracranial disease, and consequently skull x-rays were ordered. The report of the films was not entirely satisfying as to her skull, but fortunately observation showed improvement, and she was saved a pneumoencephalogram.

No psychological problems were uncovered after cure, in reviewing the case with the mother. It was interesting to note that as the child improved she had to resort to her glasses less and less. Finally it was noted that she never used the glasses except after a scolding by her father. The mother's only suggestion was that menstruation started about the time the vision began to fail, and some connection was presumed.

The ophthalmologist saw this girl only three times before a cure was effected, and yet because of poor cooperation between various doctors—due entirely to each being independent and not having sufficient time to talk over the details of the case—the child was subjected to examination by many physicians, including hospitalization for a week in a neighboring hospital. During this hospitalization all the x-rays of the skull were repeated, together with much unnecessary laboratory work. This case demonstrates two things, concisely: (1) the value of taking visual fields; and (2) the necessity of physicians' reporting their findings to one another.

These cases have illustrated the presence of ocular neurosis or simulated ocular disease in the anxiety state and hysteria. The anxiety state is the most common of the ocular psychoneuroses.

Ocular Disease Related to Psychoneuroses

Any ocular disease may be complicated by any psychoneuroses. Some of the more common ocular diseases or defects that are associated, either complicated or caused, by the psychoneuroses include: the refractive errors and muscle anomalies (squint); and primary ocular diseases, such as glaucoma, cataract, iritis, keratitis,

etc.; neurologic ocular diseases, such as nystagmus, field changes, etc.; medical ocular diseases, such as retinal hemorrhage, etc.; and surgical ocular conditions.

The case of J. B. illustrates how glaucoma may be related to an anxiety state:

J. B. was a male, aged 68. He worked as night watchman in a bank for 27 years without missing a day of employment because of illness. One night a fire occurred in the basement. In opening the doors to let firemen in, smoke and flames struck him in the face. He became ill, vomited, and was taken home. The next day he went to work as usual, but his eyes smarted and were slightly red. He noted occasional spells of blurred vision, and thought he saw smoke in the room at certain times. These symptoms persisted ten days, when he consulted his family physician. He was treated for ten more days for nervous shock, and then was sent to an oculist who diagnosed acute glaucoma in his left eye, which was operated upon.

The patient suffered agonizing pain in the left eye for the next six weeks. Operation was performed, but absolute glaucoma developed in this eye. The right eye was under a tension of 40 mm. of Hg. and had a complete loss of field superiorly. This patient was badly scared by the fire. He said he shook all over when he discovered it. Possibly his vomiting was the result of an acute anxiety state. From the history it is apparent that the glaucoma developed immediately after the nervous shock of the fire. This patient lost an eye entirely, and may well lose all useful vision in the second eye as a result of glaucoma.

Is the employer liable for nervous shock that employees receive during their employment? Is it generally accepted that glaucoma may arise as a result of nervous shock? Is the patient at fault or should ophthalmic advice have been obtained earlier than the twentieth day? Was chronic simple glaucoma present before the fire?

While many pages could be written about this case to substantiate the claims of both sides, it is my opinion that this patient lost one eye as a direct result of events arising out of the fire. His remaining sight has been seriously endangered permanently, and he is therefore entitled to compensation and necessary medical and hospital care for the rest of his life, for the disease contracted in the performance of duty.

To illustrate how vascular spasm in the brain may lead to permanent brain damage, we report the case of J. G.:

J. G., a male patient of 49, suffered a vascular lesion 60 hours after a divided dose of tetanus antitoxin was administered. Both his home and business life were in a state of disorder at the time. A laceration was treated in the accident room, and he returned home. Sixty hours later he fainted and vomited, and his vision became clouded and remained so. He was partially paralyzed for a few minutes. He was rehospitalized on medical service, two lumbar taps were taken and the reports were negative, after which he was discharged. He reported to the ophthalmologist three weeks later with a field defect which has remained constant for 12 months. Observation of the fundi disclosed veins engorged. Arteries were generally and irregularly narrowed grade 2, with early swelling of the discs. There was a scotoma, dense to hand movements. Accommodative weakness and disc swelling gradually subsided.

This serious vascular lesion resulted from some serious damage to the blood vessels. It is hardly conceivable that a dose of tetanus antitoxin could be blamed for this entirely, knowing that the man's home and business life were extremely upset and his whole happiness endangered. It is more likely that the vascular damage had as its basis the emotional upset. We see the same type of etiology in many cases of coronary disease. It may also be that the combination of the emotional upset with the injections of tetanus antitoxin caused the vascular lesion. These are only a few illustrations of the psychosomatic aspects of eye problems.

Conclusion

The relation between definite organic eye diseases, either caused or complicated by ocular psychoneuroses, is a tremendous subject to which conscientious internists, ophthalmologists, and psychiatrists can make an important contribution. It is up to them to pool their experience and knowledge for the benefit of mankind.

Meeting Our Eye Problem in Industry*

George L. Mitsch, *Plant Manager*

St. Louis Foundry, American Car & Foundry Company

"GREATEST problem in eye safety today," says the author, "is lack of personal interest." Industry must meet the challenge.

IT has been my privilege to attend several safety conventions, both national and regional. Perhaps because I am not a safety engineer, and can witness activities as an outsider, I have noted one outstanding thing—get a group of safety engineers into vigorous discussion and within five minutes one of them will make the statement: "You've got to sell management."

Cost of Eye Injuries

When the plant manager or superintendent looks at his accident cost sheets and sees the enormous amounts of money being expended for hospitalization, compensation, medical and legal fees, idle machines and the wastes of human productivity, he's sold! And he has been sold for many years on the idea that safety is good business. Otherwise there would be no safety engineers in convention here today.

No mention has been made of humanitarianism, but there is no member of management worth his salt who does not put the safety and welfare of his employees above everything else. After a serious accident no person outside of the immediate family of the injured feels more badly and more responsible than the members of the management team. A fatal accident has made many a supervisor and manager wish he had been hundreds of miles away. I can think

* Text of address delivered October 24, 1949, before the Metals Section of the 1949 National Safety Congress, Chicago, Illinois.

of something worse—not a fatality but still a tragedy—an industrial casualty—blindness.

Figures are available from other sources, but the unfortunate facts are that too many men and women are going home from their jobs via the hospital, either partially or completely blinded. The time has come to stop this sentencing of employees to this catastrophe. These eye injuries happen not only in heavy industries but in some occupations most of us think are wholly safe. Let's examine the record. Is your industry above average? Mining is 7½ times the national average; foundries (my own field) are 6 times the national average; lumbering, 4 times; smelting, 2½ times; quarrying, 2 times. Construction, machine manufacture, public utilities, food preparation, machine shops—all are above average. Just below average, but certainly hazardous, is chemical manufacturing. Records show that there is a total of 21 lost-time eye injuries for every million man hours worked.

Imagine a plant of 500 men. Then think of 21 men a year suffering eye injuries resulting in lost time and probably permanent or partial disability. How many "near misses" are not on the record? How many foreign bodies could have been just a little deeper, just a little closer to the vital part of the eye? We don't know. No one knows. We can only be thankful.

Several years ago we had a molder who was not overly sold on wearing goggles. While shaking a casting out of the mold, hot sand got in both his eyes almost fusing the lids to the eyeballs. Several months of medical attention were required. Fortunately no permanent impairment of sight resulted. That man learned his eye protection lesson the hard way. He learned well—but this is not the answer.

Safety Program in St. Louis Plant

There have been many answers to this question of eye conservation. Programs successful in one plant may be wholly unsatisfactory in others. Some programs have involved large expenditures of money for painting and lighting, guards and goggles. Let me tell you a bit about the general safety program in our plant—a rather large foundry as foundries go.

As mentioned earlier, the eye injury frequency rate in the

foundry industry was six times the national average, or 3.99. Yet I am proud to say that as far back as our records go, to 1923, there has never been an eye lost or partially disabled in our plant. Our over-all record has been such that for the past two years we have won the heavy industry safety competition in St. Louis, together with many prior awards. During the convention we shall be presented with an award from the National Safety Congress for being third in our category in the national contest.

Safety Plan Must Reach Each Individual

To a large degree this success is a result of one thing—taking safety to the employee on a strictly personal basis. You seldom hear of plant managers, safety engineers, or foremen getting hurt. Those who get hurt are from the rank and file—the average workers who in probably 95 per cent of the cases are responsible for their own injuries. So why restrict our safety education and salesmanship to the safety engineer and the foreman? Why should we spend hours and many dollars educating them, a relatively small percentage, and then merely put up a poster or a set of plant rules for the men on the firing line? Certainly foremen must be educated to set good examples and to prevent employees from hurting themselves. It is interesting to note that the lowest frequency in eye injuries occurs in plants where the responsibility for enforcing goggle wear is placed on the foreman. But more than foreman education is needed. Couple enforcement with personal education and the results are astounding! Here's how we do it in our plant.

Department Safety Meetings

The meetings are a compromise between the formal and the conference types. The chairman is a workman who has been selected by the others and who is perfectly free to discuss any phase of safety he so desires, whether it be safety in the home, the plant or the street. Of course we prefer discussions concerning the plant and the respective department. But we realize the advisability of devoting much time to off-plant safety. The employee who crosses the street without looking is the same individual who will cross plant roadways without looking. The employee who is trained to maintain good housekeeping at home will prevent accidents in the plant.

The formal opening of the meeting is the reading of the minutes of the previous meeting and a report of the past month's experience by the safety director whose sole function is to act as secretary. The minutes contain all suggestions and comments made at the last meeting. If for any reason a suggestion has not been complied with an explanation is given, thus insuring the continued interest of the employee who made it.

Interest of the Union

In our plant we have a very active union; yet it is interesting to note that not one grievance involving the safety and welfare of our employees has been presented. Not even in 1947, when unions all over the country were demanding—and in many instances with justification—a voice if not complete control of plant safety programs, were we even questioned on safety.

Do Meetings Pay?

While there is nothing exclusive or new about these meetings, nevertheless they have provoked a great deal of interest and inquiry among our local industries. Everyone agrees it sounds like a good idea, but management sometimes loses enthusiasm when it is realized that employees are paid for the time spent in the meeting (in several departments it actually involves overtime pay). Do the results justify the cost? We know they do—(1) in reduced accident rates; (2) in better morale and incentives toward personal safety; (3) in getting ideas, often unorthodox to the outsider, on improved and safer methods; and (4) in instilling in the employee the golden rule, and the thought that "I *am* my brother's keeper." As such, every employee is a participating member of the safety committee.

We are convinced that these meetings have been largely responsible for our low general accident rate and (to a large degree) for our success in practically eliminating eye injuries.

Goggles Program Pays

Fortunately, many years ago a 100 per cent goggles program was instituted at our plant and we have been constantly endeavoring to improve upon it by adopting new developments as they appear.

However, our one constant source of worry has been that an employee would expose himself through wilful or thoughtless failure to keep his goggles on and thus suffer a serious injury. This fear is not by any means restricted to us. It is the biggest problem in eye protection today. The records are full of accidents occurring to employees who, through just a moment's relaxation, find themselves sentenced to lifelong darkness. These unfortunates include the man who thought he could grind his tool in less time than it would take to put on his goggles; the man who takes his goggles off so he can make a quick dash for lunch or shower room; the man who takes his goggles off because the job he is working on is hot and the glass fogs. These are the men who must be protected from themselves, and this is where safety meetings pay off. Realizing that he *is* "his brother's keeper," a fellow employee instantly warns the offender of his danger. I have seen it done time and time again and never have I seen any resentment displayed by either party; whereas I am sure that if it had been the foreman who had offered the suggestion, it might not always have been received in the same spirit.

Management and safety directors must be constantly on the watch for failure to wear safety devices, because while usually it is merely carelessness it may also indicate that something else is wrong. It can mean that the goggles do not fit or are uncomfortable —a matter for easy correction. Or it may be that an employee actually cannot see and requires special prescription lenses. If he is wearing such lenses they may be satisfactory for reading a chart, but not for meeting all his working conditions.

Periodic Visual Checkup

An employee whose prescription goggles were designed for close work may require a revised prescription should he be transferred to another job, such as operating a crane. We are advised that seven out of ten adults required spectacles off the job. I wonder whether 70 per cent of our employees have prescription goggles, or is it closer to 10 per cent? We are also told that eyes change as we grow older, and they should be checked every two years, or even more frequently. Do our employees still have the same goggles they were given when first hired? How foolhardy to expect results from a goggles program when employees may not be able to see through

the goggles. No eye program can be successful without good follow-up procedures.

Nor can we stop at the lenses. What should we do about frames? A big problem in keeping goggles on employees working in great heat has been the transmittal of heat by the metal frames. Plastic frames were to be the answer. Yet there are plastics and plastics, and unfortunately not all are good. A short while ago one of our molders caught a splash of iron on his goggles frame which started to burn. Fortunately he was just finished pouring and his hands were free to pull off the goggles. His eyelashes and forehead were burned, but there was no injury to his eyes. A little delay—and what could have happened is anybody's guess. Investigating this injury, we learned that the supplier had changed plastics without notice and the safety guard had actually become a hazard.

There are goggles of all types on the market—some, single-purpose types, others, for general application. An attempt has been made by the manufacturers to dress them up, with the thought that employees would be more likely to wear attractive goggles than those which are cumbersome and not so appealing to the eye. But let us not forget their prime purpose—to save eyes.

The Wise Owl Club

Who has not heard of the wise old owl who sits in the tree and knows all? But have you heard of the Wise Owl Club? We are proud that the Wise Owl Club originated in our company. In St. Louis we are particularly proud that it was a worker in our Foundry who first made the suggestion that the club be formed. Joe Folks, a worker in our chipping and grinding department, has always been a leader in the safety meetings. Over a period of years he has seen a number of "near misses," where eyes have been saved by wearing goggles. As he worked at his bench he had an idea. Unlike most of us he didn't hide it, but presented it to the proper authorities. In the past two years it has become recognized as one of the greatest incentives for wearing goggles. Having in mind the Caterpillar Club, the members of which are aviators who have saved their lives by using parachutes, Joe suggested the formation of the Wise Owl Club; the membership to be comprised of our employees who had saved an eye by wearing goggles. The idea took hold immediately.

A survey of our ten plants was made, and 76 candidates were found eligible. The club was formed; membership pins and certificates were presented in appropriate ceremonies. That was in 1947. In two years the membership has grown to 180 employees; 104 eyes saved.

The company made the club idea available to the National Society for the Prevention of Blindness, which has administered it outside the American Car & Foundry Company, for the past year. Already 96 plants in 22 states have formed chapters, representing 650 eyes saved; 620 human beings saved from incalculable misery, from lifelong blindness. Incidentally, the estimated saving in compensation amounts to $1,625,000.00. Do safety meetings pay off? A lot of meetings can be held for $1,625,000.00. A lot of goggles can be bought for $1,625,000.00.

And who are the greatest beneficiaries? The men whose sight was saved; the fellows we work with. I know personally 27 members of the Wise Owl Club, including my own father. Each has had an experience which demonstrates the value of goggles very forcefully.

Wise Owl Club Good Safety Education

A great educational program is needed to make our factories safe for workers and our workers safe for industry; a program which requires the patient toil of many men and the expenditure of many dollars. But what an achievement that will be—worth a hundredfold every dollar, every pair of goggles, every Wise Owl pin and pat on the back.

The earlier in life a person can learn to behave in a certain manner the more positive that behavior becomes. This same principle applies in teaching people to wear goggles. A major blow against blindness is being delivered daily by progressive trade and high schools who recognize their duty not only to teach pupils to do a job, but also to do it *safely*. In New York State the Hastings-on-Hudson High School has instituted a goggles program in all industrial arts courses, and has received the Wise Owl Club charter. The boys and girls learning their trade at Hastings will immediately associate safety, particularly eye protection, with production when they enter the industrial world.

Yes, we have an eye problem in industry, and summing it up in a few words we can call it a lack of personal interest.

Many things can be done to bring us nearer the goal of *no* industrial accidents causing blindness. Some we have discussed, others will follow. You undoubtedly have your own ideas, but remember that an idea is only as good as the use to which it is put. Check your plant. Is management doing everything possible to improve facilities? Do you have a "man-to-man" program? How about a Wise Owl Club? And how about checking the safety education being given your employees before they're hired?

Let's set our goal at a hundred per cent freedom from all eye injuries. Let's blot out blindness!

School Lighting Studies

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A VARIETY of lighting units serve as models for the improvement of classrooms, drafting rooms and offices.

THE Massachusetts Institute of Technology, in common with many schools and colleges, faces the problem of improving the artificial illumination of its classrooms, drafting rooms and offices. Many of the spaces constructed in 1916 have not been relighted. In addition there are new buildings being constructed on the campus in which it is desired to have lighting of high quality.

About two years ago a small committee was formed to study this problem and to determine, if possible, improved applications of commercially available light sources. The committee has been interested not only in providing high-quality lighting but has also endeavored to reduce maintenance.

Three types of lighting have been developed and installed in Institute rooms: luminous ceilings, partial areas of luminous ceilings, and luminous-indirect luminaires. Each of these methods is discussed in this paper.

Luminous Ceilings

These installations consist of mounting channels supporting slimline fluorescent lamps fastened directly to the structural ceiling slab. Hanger rods, also connected to the slab, support a metal T-bar chassis suspended about two feet below the slab. The horizontal faces of the T-bars support thin translucent corrugated plastic sheets. Suspended immediately below the T-bars are acoustical baffles, trapezoidal in cross section. The baffles are perforated and are filled with a suitable sound-absorbing material. This method of

lighting has, in our opinion, many advantages. It provides a very large area of low brightness. With the appropriate selection of wall materials, colors, and furniture, it insures a room with low-brightness ratios and provides excellent diffusion. The architectural result, in our opinion, is quiet and discreet. Pipes and ducts are easily concealed and yet remain readily available for maintenance. The rows of lamps may be controlled in various combinations to provide readily several levels of working illumination.

The luminous ceiling as a source of light is not new. The effort in this study has rather been toward adapting new materials and equipment to such a design and to providing an efficient solution to the acoustical problem where the usual acoustical ceiling treatment is impossible.

The luminous ceiling is primarily not decoration but a source of fine lighting. It is hoped that applications of luminous ceiling lighting may recognize this fact in order to avoid its becoming a cliché.

At the Massachusetts Institute of Technology, classroom and office applications of this design have now been in use under varying conditions for almost a year. A group of graduate students has used one of the rooms for a number of activities—drafting, reading and typing. It is interesting to note that while preferences are divided as to the value of illumination over a range of 25 to 70 footcandles, there has been an unqualified enthusiastic response to the quality of the light.

Partial Areas of Luminous Ceiling

Very large luminaires have been installed in a seminar room and in a lecture hall. The seminar room measures 15 by 24 feet and has a ceiling height of about 15 feet. One large 4-by-16-foot luminous panel was installed, suspended about three feet below the ceiling. With only about 18 per cent of the ceiling areas utilized for the lighting panel, a surprisingly good uniformity of light is provided, varying from 42 footcandles directly under the center of the luminaire to 40 footcandles at the walls. This fixture remained in use one year without cleaning. Readings were then taken which showed a depreciation of about 25 per cent. After cleaning, illumination was restored to within a few per cent of the original values.

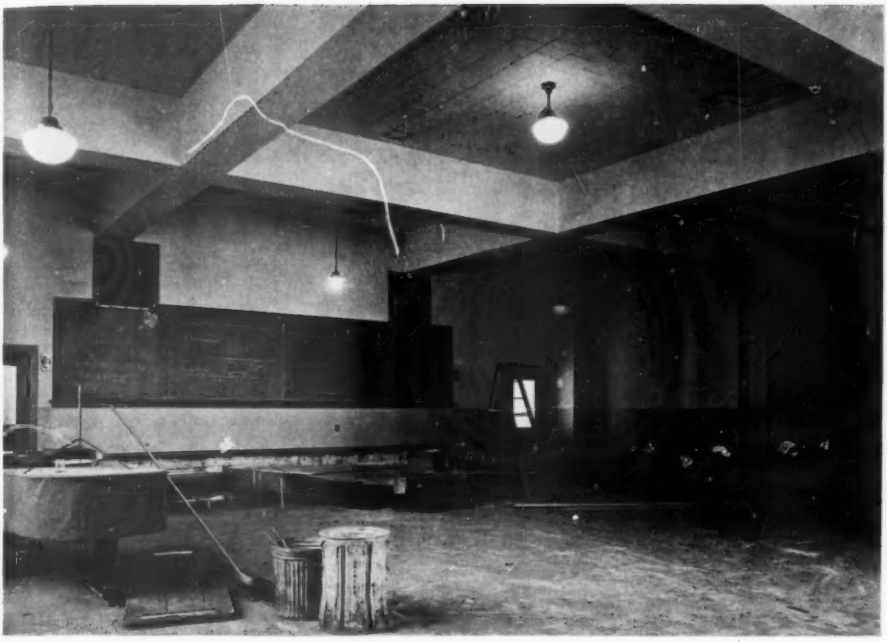
The fixture consists of a rectangular boxlike structure about nine inches deep with slightly sloped enclosing faces. The 16-foot length accommodates two rows of 8-foot slimline lamps mounted about eight inches above the corrugated translucent plastic surface covering the horizontal lower area of the fixture. Provision was made also for sealing the upper surface of the fixture with clear plastic sheets. It has been our experience, however, that desirable maintenance conditions are obtained even without this upper plastic surface.

The installation in a lecture hall seating 200 students has just been completed. The room measures 40 by 40 feet, and is 15 feet in height. Twelve luminous panels, 3 by 6 feet (about 14 per cent of the total ceiling area) have been installed. These panels are similar in design to the ones used in the seminar room and have 6-foot slimline lamps for the general lighting of the room. In addition, each of the panels is provided with four small incandescent lamps which are intended to provide a low level of illumination to facilitate the taking of notes while lantern slides are being projected on a screen.

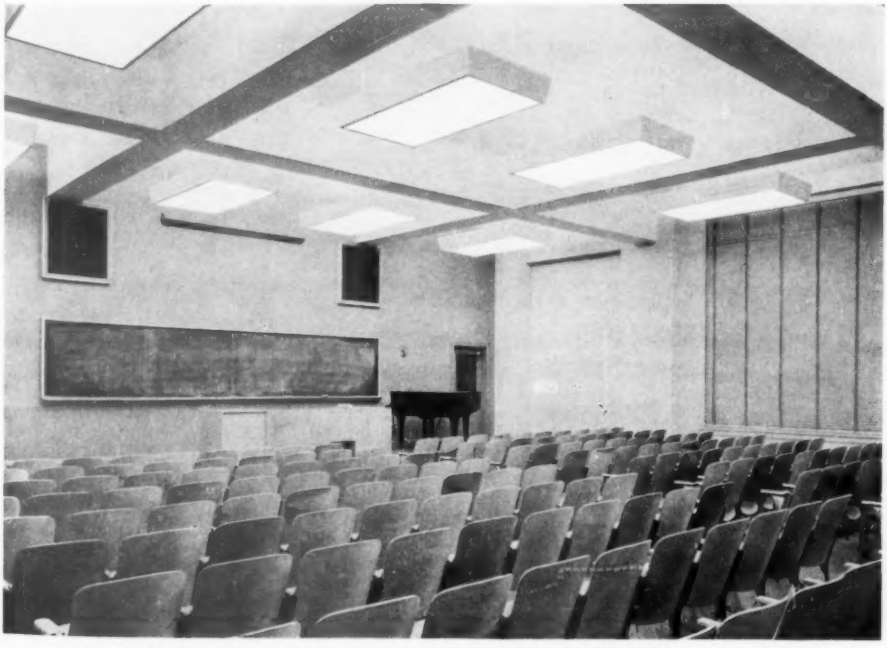
Luminous-Indirect Luminaires

From the viewpoint of excellent quality of illumination, several units of the type here under discussion are commercially available. The luminaires are designed to have a brightness approximately equal to ceiling brightness. Previous fixtures, however, have been open above the lamps; and in an industrial or dirty environment, they present, in our experience, a maintenance problem. It has been our effort in this study to design an enclosed unit that is simple in profile and with no sharp or awkward protrusions.

The resulting fixture is a simple plastic tube, 6½ inches in diameter, the plastic for the lower half being selected to provide the correct brightness ratio with the ceiling, and the upper plastic half being clear. Where the two half cylinders meet, a dust seal is installed. The cylinders are supported at the ends by circular cast aluminum discs. These discs also furnish mounting for the lamp sockets and the starters. The luminaire is supported by hangers connected to the discs and to mounting channels on the ceiling. These channels also serve as wireways and as a place to locate ballasts. The fixtures are designed in 8-foot lengths using slimline

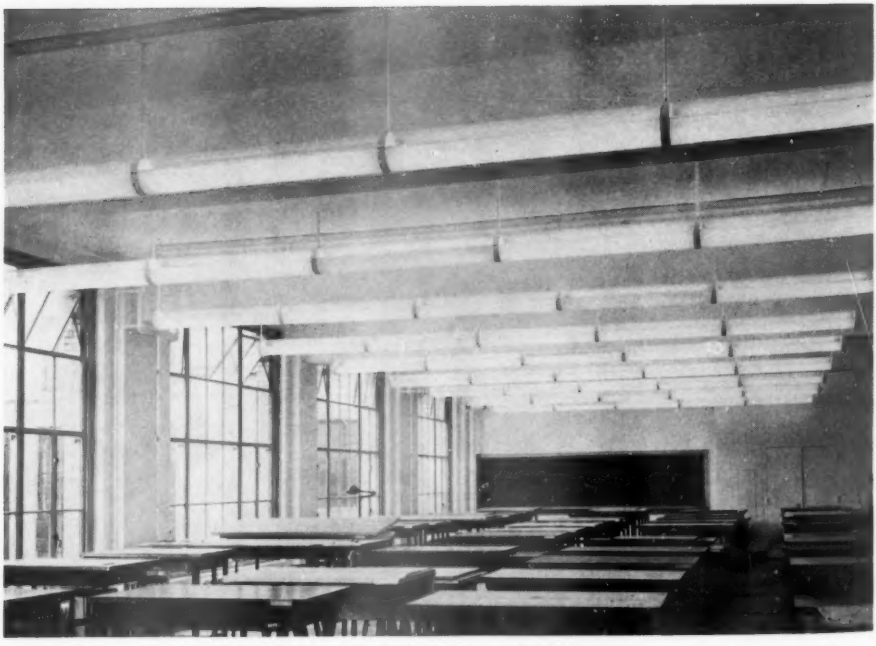


Lecture hall before renovations.



Lecture hall after renovations, showing full intensity of light. Light can be dimmed for showing slides and note-taking at the same time.

Luminous ceiling in an administrative office (note acoustic baffles).



Luminous indirect lighting in a drafting room.

lamps, also in 4-foot lengths using standard fluorescent lamps. All metal parts have been finished in white enamel so that the unlighted fixture blends into the ceiling.

Fixtures of this design have recently been installed in five large drafting rooms in the Massachusetts Institute of Technology School of Architecture and in one drafting room in the department of civil engineering. Two rows of fixtures per structural bay, shown in picture opposite, provide a level of illumination of about 60 footcandles and utilize 2.3 watts per square foot (excluding ballast losses). These results were obtained before depreciation had taken place in the lamps and with ceiling and walls newly painted. It is anticipated that the maintained level of illumination will be between 45 and 50 footcandles.

The first installation of these fixtures was made in an administrative office of the Institute nearly two years ago. After a year of use, intensity readings were taken and the fixtures then thoroughly cleaned. Readings after the cleaning showed no appreciable lowering of efficiency due to the accumulation of dirt. It is planned, however, in order to keep the quantity of light in the drafting rooms at a high level, periodically to clean the outside surface of the fixtures.

The drafting-room installations have been in use only a few months. During this time a group of graduate-theses students had occasion to give them a good preliminary test and appear to be very pleased with the quality and quantity of the light.

The Institute and the Lighting Committee are deeply appreciative of the inspiration and advice rendered to them through the services of the consulting engineer of the National Society for the Prevention of Blindness.

Eye Health—A Challenge for Nurses

Helen E. Weaver, R.N., *Consultant in Nursing Activities*
National Society for the Prevention of Blindness

THE author points out the opportunities for sight conservation which every nurse meets in her work, whether it is in the field of public health, industry, school, or hospital.

CARE and protection of the eyes are an integral part of good nursing service in every nursing procedure. Nurses who understand the care and protection of the eyes can render an invaluable service to the family, the community and to the over-all program of prevention of blindness by making eye health teaching a part of all family teaching. Regardless of whether she is a student nurse, a graduate, institutional or private duty nurse, or a public health nurse in a school, industry or on the staff of a visiting nurse service, the nurse can and should aid in the conservation of vision and prevention of blindness.

Indirectly, all functions of nursing which promote and contribute to improved general health, assist in saving sight and maintaining eye health, but nursing service must go beyond this by setting up specific goals and areas of eye health teaching.

Public Health Nurse

The public health nurse contributes to sight conservation through all her health teaching and supervision, in prenatal care, in her follow-up and supervision of patients receiving treatment for venereal disease, and in all phases of disease prevention, but an even more direct approach is needed by the public health nurse who has unlimited opportunities in her home visits, in her clinic contacts, and in the many other aspects of her varied activities.

In eye health, the nurse's services will be based on four major needs:

(1) for securing early diagnosis and treatment of beginning eye conditions; (2) for proper protective measures to prevent injury and infection of the eyes; (3) for improving conditions under which eyes are used; and (4) for continuing medical follow-up as long as indicated.

In order to meet these needs, the nurse must have background knowledge in the normal functioning of the eye and be aware of the relationship between general health and the eyes.

A knowledge of normal eye development, as well as of the most frequent deviations that may result at various stages in the developmental process, is extremely important to the nurse. For example, if she is aware that untreated crossed eyes in a young child may result in loss of vision unless the child is placed under treatment at an early age, she will be more persistent in her efforts to bring the child under care. She must also understand the emotional feeling which influences eye treatment.

Eye Health in Schools.—Many public health nurses are directly responsible for providing services to schools. In other instances, though the nurse may not provide service to the schools, she often finds it necessary to work with the school nurse. Here there are unlimited opportunities for carrying out sight conservation, such as giving screening tests to determine children who need glasses, the screening of children for eye infections in order to prevent a generalized epidemic in the school; and the over-all interpretation of eye health as part of the general physical well-being of the child.

The public health nurse should be familiar with the principles of schoolroom lighting.* If it is poor, she should endeavor to find ways in which adequate light may be provided; whether it is possible to light the room with the materials at hand; whether the teacher is utilizing the opportunities which the room offers; and if not, how to encourage and stimulate the teacher to do so. The nurse should observe whether chairs and desks are arranged to the best advantage in the room.

* See "Schoolroom Lighting," publication No. 498, National Society for the Prevention of Blindness; also the Society's lighting checklist.

The placement of the windows in the room, the arrangement of the shades, the size and character of the written work on the chalkboard and the amount of light in the room on a dreary day are also of concern. Knowledge of all these factors provides a useful foundation toward improvement of lighting in the schoolroom.

There are many children (approximately 1 in 500) who, because of low vision, are unable to carry on their class work with the other children. Often it is necessary to transfer these children to special classes. This is done only through ophthalmological recommendation. When such a transfer is made, the nurse must interpret the sight-saving class to the parents and to the teachers. It is also necessary for the nurse to give special health supervision to the children who make up the sight-saving class; frequently additional nourishment and other special privileges, such as rest periods, must be provided.

Opportunities for Sight Conservation Through Family Service.—Since the public health nurse provides a family service, she encounters many eye diseases in the homes. Perhaps the more common of these are glaucoma, cataracts and, more recently, retinitis pigmentosa and retrolental fibroplasia. What is the nurse's responsibility in these conditions? First of all, her teaching should be based on facts. In cataracts, surgery has proved most successful when performed by a competent surgeon. Usually recovery is uneventful and the patient, after he becomes adjusted to his glasses, will be able to see well. Glaucoma presents a more serious problem since the sight lost cannot be regained and frequently much of the side vision is lost even before the diagnosis. The only hope of retaining vision lies in the early discovery of the condition, prompt ophthalmological treatment, and, if necessary, surgery. Treatment of glaucoma is usually prolonged and, occasionally, repeated surgery may be necessary. These patients are discouraged easily and increased ocular tension results from their emotional disturbances. In her contacts with the older age groups, the nurse should teach patients to suspect failing vision and, when frequent changes of glasses are made without results, more detailed medical care should be sought. The nurse also needs to encourage patients to continue ophthalmological care even though it is required over a long period of time. She can also help them overcome the fear of surgery. It may be

necessary for her to work with them in order to have them seek new employment which will require less strain on their eyes.

In the case of cataracts or glaucoma, patients can be helped considerably if found in the early stages, but at this time there has been no prescribed routine or treatment for either retinitis pigmentosa or retrolental fibroplasia. It is hoped that research now being carried on in both these conditions will result in the discovery of means of prevention and treatment.

The public health nurse needs to understand the importance of eye health in such conditions as diabetes, cardiovascular disease, central nervous disorders, nephritis, syphilis, and many other generalized conditions. Eye care is extremely important in connection with all of these diseases.

Industrial Nurse

Today, with the increased number of persons between the ages of 40 and 65 who are employed in industry, there is a real challenge for the industrial nurse to have an effective eye health program. Normal physiological changes which occur in this age group set up a need for visual screening prior to employment, and frequently throughout employment in order that the employee may give his best services.

The industrial nurse's program should be decided upon by the medical department and management. Protective goggles and safety devices should be provided to guard against the many eye accident hazards found in the plant. If chemicals are used in the plant, then the industrial nurse will need to know the effect of these chemicals on the eye and the toxic symptoms. The removal of a foreign body may seem a very small service for the nurse to provide, but a good industrial nurse is alert to the dangers in the removal of foreign bodies and follows a definite and approved procedure, so that there can be no misunderstanding between the medical and nursing departments.

Above all, throughout her service the industrial nurse should carry on an educational program in cooperation with the safety engineer and management, so that employees realize the advantages of continuing an accident-free record.

Hospital Nurse

In the care of patients with eye problems, the nurse is called upon to provide the best possible nursing care and to relieve symptoms. A special approach is needed for patients suffering from eye conditions, regardless of whether their condition is only a temporary one or one of long standing.

In patients who are not suffering from eye conditions, nurses must nevertheless be alert to any manifestation of eye symptoms and must provide a comfortable environment for the convalescent period. Special consideration should be given to shading the windows, turning the bed to prevent too much direct light in the patient's eyes. As the patient progresses to the convalescent stage, his posture and light for reading need to be carefully watched.

When the patient wears glasses, there is an excellent opportunity to teach about the care and purpose of his glasses, the necessity for proper medical care for eye conditions, and the value of having eyes examined as frequently as advised by the physician. Nurses may be asked about the use of eyewashes. The use of these should be discouraged unless there is a specific order, since nature has provided tears as its own way of cleaning the eyes and the inner surface of the lids.

Student Nurse

If there is to be a closer correlation between theory and the care of the patient, students of nursing must be taught care of the patients in the field of health as well as disease, the social significance of illness to the family and to the community, and ways to assist the patient in making mental and physical adjustments. Throughout the training period, subjects such as personal hygiene, nutrition, medical arts, first aid and case studies will provide an excellent medium for making the nurse aware of eye problems and their solution. Many eye conditions may be caused by disturbances elsewhere in the body, which in turn affect the general well-being and personality of the patient.

During the student nurse's experience, every opportunity should be given her to see problems relating to the care and use of the eyes and she should have opportunities to develop skill in meeting nurs-

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ing responsibilities for eye care as part of the nursing care of the patient.

Eye Hygiene for the Student Nurse.—The first step in such a program might begin by teaching the student the care of her own eyes. This can best be done by an examination of the candidate's eyes on entrance to the school of nursing, made in connection with her physical examination. This is important not only as a means of stressing the importance of eye health, but as a safeguard both for the training school accepting the student and the student herself. There have been occasional students who, after completing six or eight months of training, have been discovered to have a progressive eye condition which kept them from continuing their training.

A second step in teaching the student desirable eye health practice is the provision of proper lighting and equipment for doing her visual work. If the student nurse is provided with modern acceptable lighting equipment in the nurses' home, in the classroom, in the wards, in the clinics, and especially in the nurse station on the ward, she is able really to appreciate firsthand the relationship of lighting to seeing and this in turn serves to influence her attitude toward the importance of light and makes her alert to the need to adjust the light to her own and her patient's needs.

Usually the student's experience in eye care is confined to a small group of patients admitted to the general ward for a specific eye condition or to clinic experience with eye patients. When a student nurse is assigned to the eye clinic service, she should be given the opportunity to hear and have an interpretation of all eye difficulties. The instructions by the ophthalmologist to the patient should be part of the student's experience and the reasons for prescribing and carrying out treatments should be made clear to her.

The hygiene of handling infected material, the teaching of personal hygiene for the protection of the patient's and the nurse's eyes, are important aspects of the nurse's training and should be stressed in the nursing arts. The use of protective goggles may be necessary, and the student nurse should be provided with them. The importance of nutrition to eye health can be emphasized by having the student thoroughly versed in the symptoms of nutritional disturbance, and she should be encouraged to recognize

these disturbances as they are manifested by patients in the clinic and on the ward. Many patients coming to the hospital for other conditions may also have an eye condition needing care. If the student nurse is encouraged to investigate and discover such problems in patients on general wards, she will become accustomed to considering eye health in relation to all health problems, and she will be impressed with the number of neglected eye conditions.

Lighting Notes for All Nurses

Nurses may question whether the problem of lighting merits their attention. It is true that most lighting fixtures are part of the permanent equipment of the hospital ward or the room. However, there are a few general principles which should be considered and with which the nurse should be familiar if she is to provide the best nursing care to her patients. Briefly, these principles are: (1) there should be no glare within the field of vision; (2) the light should be directed, diffused and distributed in such a way as to prevent sharp contrasts around the working area; and (3) the light should be adequate in amount for the particular job that is to be done.

It must also be remembered that some people require much more light than others. In certain eye diseases a great deal of light may be needed, while in others only a very limited amount of light is permissible. Regardless of whether nursing service is provided in the home, the school, or in industry, the light should be adjusted to the purpose for which it is being used and for the person who is performing the task.

Summary

Eye problems arise in a variety of nursing situations. In providing any type of nursing care, the well-trained nurse will strive to recognize and meet the implications for the care of the eyes.

Her ability to interpret signs of eye trouble as danger signals worthy of study and examination may be the major factor in decreasing the number of sightless and partially sighted persons.

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The Forum

THIS section is reserved for brief or informal papers, discussions, questions and answers, and occasional pertinent quotations from other publications. We offer to publish letters or excerpts of general interest, assuming no responsibility for the opinions expressed therein. Individual questions are turned over to consultants in the particular field. Every communication must contain the writer's name and address, but these are omitted on request.

The John Ruskin School in London

Editor's Note.—In the United States, classes for the partially seeing are generally coordinated with the regular classes, and such practice is recommended. The following article, therefore, is presented not as a recommended practice in the United States, but to acquaint our readers with the methods followed in another part of the world.

The silence of the suburban street is broken by merry laughter and the sound of children's voices. Here in southeast London the boys and girls of the John Ruskin School are enjoying themselves in the playground. The casual passer-by would find it difficult to believe that they began life with one of the severest handicaps that fall to the lot of man —defective eyesight. They are not, indeed, quite blind; but their sight is impaired to such an extent that they cannot go to an ordinary school.

Thanks to new methods of instruction applied at the John Ruskin School and at five similar schools in various parts of London, the disabilities of these children are no longer a major obstacle to their education. After medical examination by the London County Council ophthalmologist the children are transferred from primary schools to special schools of the John Ruskin type. Early diagnosis and treatment affect very favorably the chances of success, for up to the age of eleven the condition of the eyes and the power of vision are subject to considerable fluctuation.

Teachers at these special schools have to adapt themselves to an exceptional degree to the physical and mental characteristics of each pupil. And it is of primary importance that the classes should be smaller than normal. At the John Ruskin School there are 71 children

in five classes. Mr. Percy Dobson, the headmaster, has taken part, for several decades, in pioneer work in this field.

Blackboards for All.—No use is made of such conventional teaching aids as exercise books or spelling books. In place of a desk, each pupil is provided with a small blackboard on which the letters of the alphabet can be traced on a large scale. For this purpose thick crayons are used. Later, the children write on white paper fastened to the blackboard with drawing pins, and learn to handle ordinary pens or pencils.

Reading books, written in block letters an inch high and containing collections of English fairy tales and popular stories, are prepared by the teachers in their spare time. For pupils over eleven the John Ruskin School provides special upright reading glasses with a magnification sufficient to enable even the most shortsighted of the children to read ordinary print.

Certain subjects such as geometry, arithmetic, geography and natural history require special treatment in the form of object lessons. But this is difficult when the pupils have bad sight. Mr. Dobson and his assistants, however, have shown great ingenuity in overcoming this difficulty. Methods of calculating the areas of various geometrical figures are explained with the aid of a box into which wooden triangles, rectangles and parallelograms are fitted by the pupils. A model made by Mr. Dobson serves to demonstrate the theorem of Pythagoras. A large wall map of Britain cut in wood, and other special delineations traced with the aid of stencils, are successfully used to acquaint the pupils with the geography of their own country and other parts of the world. And in teaching this subject wooden models are again introduced, with excellent results.

Normal Occupations.—The aim of the John Ruskin School is to enable the pupils, in spite of their infirmity, to take their place in the world as ordinary individuals, and engage in normal occupations. Four buses fetch the younger children from their homes and take them back again; but Mr. Dobson advises the older pupils to use public transport wherever possible, in order to accustom themselves, at an early stage, to traveling alone. Another feature of the John Ruskin curriculum is physical exercise, and many of the pupils take part in sporting events. The headmaster is proud of the large number of pupils who have won prizes for swimming.

Whenever practicable the children meet pupils of their own age from other schools. On their reaching the age of 12, the boys are sent to a manual training center, and the girls take a course of domestic economy.

To pupils of the John Ruskin School few careers are closed. Occupations involving excessive physical exertion, and more particularly,

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those that put a strain on the eyes, are of course avoided. But there are many trades and vocations in which these young people, in spite of imperfect vision, can be advantageously employed and become an asset to their employers.

R. B. JONES
London, England

Apropos of Improving Vision by Eye Exercises*

To a reader who has had a comprehensive scientific training in the subjects involved, the book, *Help Yourself to Better Sight*, by Mrs. Corbett, excites at best a variety of thoughts. Mrs. Corbett is a disciple of Dr. Bates who has elaborated methods of her own which she bases on Dr. Bates' teaching. It is not widely known that although Dr. Bates had a fine medical training in the best New York schools and laboratories, he later became insane. History is replete with the brilliant flashes of insane genius, as different from the sound scientific genius as the lightning flashes are from the steady sunlight; but one must depend on the steady light as a guide in trying to make one's way in a jungle, where the path is hard to find even in broad daylight.

Might one expect that when an author includes some sound basic facts in each chapter of her book, she would proceed to found her advice and treatment on these sound facts? Not in this book.

The methods of treatment came first and were followed by attempts to explain why these methods produced results. This sequence is the result of the inevitable craving of the human mind for explanations, for answers to the why? why? why? These questions are as natural and spontaneous as human intelligence. They antedate science and are the source not only of all science but of many old wives' tales, primitive folklore, and traditional explanations of natural phenomena. It is one of the duties of scientists who base their deductions on provable and verifiable experiments and theories to correct these prevalent notions and substitute sound theories.

The human body is an exceedingly complicated machine. Even the most accomplished scientific medical man can explain fully only a few of its derangements. The science of medicine is extending its researches successfully into the surrounding fields of the unknown and has established standards of proof essential before a theory can be accepted and adopted.

These standards of proof—the essentials of scientific proof—are appreciated by very few. Even many medically trained men, especially if they have had little experience in laboratory work, do not appreciate, and still less do they live up to, scientific standards of proof. No wonder that the average man or

* Based on a review of *Help Yourself to Better Sight*. Margaret D. Corbett. New York: Prentice-Hall, Inc., 1949, 218 p.

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woman with no special scientific training is "satisfied with the decillionth dilution of a scientific proof."*

In reviewing such books as this of Mrs. Corbett one cannot approach the subject, when addressing the general reader, as he would analyze a book for a scientific audience. Several methods are available. One can hold up to ridicule the many passages that one prominent ophthalmologist has called "silly." This seems to me a very well chosen word. It carries with it the idea that the matter does not deserve serious analysis and study; for "silly" is not an epithet applied to articles written by trained scientists. He applied the term in this case to some of the methods used by Mrs. Corbett to accomplish what she calls relaxation such as nose drawing. To quote from the book (p. 143): "This helps to loosen your head on its axis. Close your eyes and pretend that your nose is a long crayon. Draw pictures and write words with your nose, out in the air. . . . All this may seem imaginative and far-fetched but it is scientifically [*sic*!] sound, because ***whenever the mind thinks a shape or motion and the body does it, the eyes begin their vibration and better vision results.***" [The italics are mine.] It is hard to imagine a more unscientific statement. There is nothing remotely like it in science.

However, to approach the subject by the avenue of ridicule, though suitable for a medical audience, will not carry the conviction needed for a lay audience, who will discount the bald condemnation by an ophthalmologist on the ground that he is "prejudiced."

To go through the book, page by page, pointing out the errors that can be and have been proved would take too long and would be giving the book more attention than it deserves. Suppose we take a few pages at random beginning with the opening sentence: "Vision can be improved, the secret is relaxation of the mind and eye. This simple truth is the basis of the system." (Page 3).

Here are two statements: (1) vision can be improved; (2) the secret (in other words, the method) is by relaxation of the mind and eye.

It would be difficult to find anyone who does not agree with the author on the first statement. The offices of ophthalmologists and optometrists are filled with thousands of people who expect to have their vision improved.

But we must disagree with the second statement. As it stands, it says that the secret of improved vision is relaxation of mind and body. Since we all agree that vision can be improved, the question comes down to this: Among the many ways in which vision can be improved, is relaxation a widely applicable successful method?

The results of treatment in a series of cases may be indicated in one of two ways: (1) the objective

* Dr. Oliver Wendell Holmes referring to followers of homeopathy.

way, by measuring the vision, before and after treatment by some standard method generally approved by investigators; and (2) the subjective way, by asking the patient whether his vision is better. This latter method has no standing in scientific investigations. For example, some years ago I was instrumental in sending a competent young ophthalmologist to Europe to study the methods of treating cataracts without operation. There were a number of noted, and even notorious, doctors or quacks practicing various methods of "curing cataracts without surgery." After his return, the ophthalmologist tried out the methods he had learned on a hundred or more patients who had cataracts of suitable types. They were treated for a year and at the end of this time the vast majority claimed that their vision was improved and wished to continue the treatments. However, when their actual visual acuity after the full year was compared with the carefully recorded visual acuity taken in the same way before the treatment was begun, no improvement could be demonstrated by actual measurements, in almost all the cases, and in most of them some loss of vision could be clearly demonstrated. Yet these patients believed sincerely that they saw better.

This is not unusual nor unexpected in subjective findings. Every experienced ophthalmologist has seen many a case in which the patient came to him fully convinced that his sight had failed since his previous examination six months before, only to find that the cold facts of the test charts showed no loss. Such experiences lead us to place no reliance on the patient's judgment of his vision.

To be able to make a patient more efficient, more hopeful, more optimistic is an accomplishment I would be the last to belittle. I take great pride in achieving it whenever I can. It is very important to avoid mixing and confusing the objective with the subjective results—the cold facts of measured visual acuity and the warm psychological, subjective, mental responses. Unfortunately there is no way of measuring the subjective results. They are of inestimable value in treatment. No well-trained ophthalmologist but uses the subjective, personal touch, the psychological approach in many cases. Indeed, in all too many cases it is the only resource. But research and scientific study are reducing this realm of treatment and increasing the scope of objective tangible results that can be measured.

Mrs. Corbett and other followers of Bates, and Bates himself, claim actual improvement in vision—not merely more comfort, less depression and discouragement, but actually more eyesight—not merely more skill in interpreting what is seen, such as the skill in recognition of aircraft taught pilots, or recognition

of all kinds of ships by naval officers so successfully taught in the recent war, but actual improvement in seeing print or other objects.

There are widely accepted tests for the ability to see just as there are for the resolving power (as it is called) of telescopes or microscopes. The universal standard for measuring eyesight is the Snellen chart of letters or carefully graded characters of different sizes. The sizes are exactly measured so that each group of letters subtends an angle (the visual angle) of 5′ at stated distances. Thus there are letters subtending 5′ at 20 feet, others at 16 feet, 25 feet, etc. The test consists in finding the smallest size of letters or characters that can be discerned at a given distance. If the individual can see the 16 foot line at 20 feet his visual acuity is recorded as 20/16. If the best he can see is the 50 foot line at 20 feet, his vision is 20/50.

But it was soon found that for scientific studies several other factors had to be taken into account and standardized if any scientific investigation was to be made as to the effects of any treatments on vision. Are the letters black on white, or gray on gray? Obviously the *contrast* between the characters and the background is of prime importance. How are the letters or characters lighted? Obviously the *lighting* is of prime importance. One can see by moonlight, but better by daylight; and one sees better by 100 footcandles than by 10 footcandles. How long is the one being tested to be allowed to look at the test object? If the time allowed is five seconds for each letter the results will be different from results obtained when only one second is allowed. Thus the *size*, the *contrast*, the *lighting*, the *time*, the *color* and the *number of mistakes* permitted in each line, must all be carefully standardized for scientific studies. Nothing of the sort is attempted by the Bates followers. Their claims could not stand the cold test of these scientific methods.

I have gone into these details in order to impress the reader with the fact that no statement of results of vision improvement is scientifically acceptable unless the results are measured with carefully standardized methods. A good illustration is the celebrated case of Mr. Aldous Huxley. He has defects of the eyes (opacities in the cornea) which prevent normal vision. After treatment by Mrs. Corbett he felt that he could see better (vision improved). But tested by the cold facts of the test charts his visual acuity was substantially the same as before treatment. How then could he be said to have improved vision? Only by having learned to adapt himself to his defective vision, and to make the best of it, was he able to achieve an enormous increase in mental satisfaction and a greater contentment with his lot. This is no small achievement, but it is not to be confused with improvement in vis-

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ual acuity which is *what most people mean by improved vision.* They assume (rightly) that if one's vision is improved he can see more.

Mrs. Corbett follows Bates in his entirely erroneous and easily disproved theory that focusing by the human eye is accomplished by the six external ocular muscles of each eye. A person 20 years old can easily change his focus 10 diopters (from a distant object—20 feet—to an object 4 inches away from the eye). This can be shown (by a simple calculation) to require that the eyeball would have to be made an eighth of an inch longer. Since the eyeball is only one inch long this increase is very great and could easily be observed, if it occurred. It could be measured by x-rays which measure the length of an eyeball to a fiftieth of an inch. No informed ophthalmologist has any doubt about this. It was one of Dr. Bates' crazy ideas. In his book he pictured a rabbit which he said he showed to a number of ophthalmologists and he claimed they all admitted that when he stimulated the oblique muscles the focus changed. I happened to be one of the ophthalmologists who saw this rabbit, and I saw Dr. Bates try to make the focus change by stimulating the extraocular muscles. Dr. Risley of Philadelphia was looking at the eye with a retinoscope which would measure even a small change of focus. Dr. Risley said: "Doctor, nothing seems to happen." Dr. Bates, after repeated trials, said, "It isn't working today." Yet he makes the statement that *all the doctors who saw the experiment* admitted that it worked. This is not scientific, to say the least!

One of the tragic aspects of this Bates movement is that the treatment is not limited to the cases where at least it can do no harm. The cases where harm can be done are cases of early or incipient diseases or of inflammatory or degenerative diseases. Mrs. Corbett is very careful to avoid harmful measures in her own office but she cannot prevent readers of her book (who may, unknown to themselves, have some serious defect requiring the experienced skill of an ophthalmologist) from losing precious time on "mumbo-jumbo" until it is too late to save the eyes.

WALTER B. LANCASTER, M.D.
Boston, Massachusetts

Note and Comment

Preliminary Program of 1950 Conference, March 26–31.—Following is the preliminary program of the five-day conference which the National Society will hold in conjunction with the Interim Session of the Pan-American Association of Ophthalmology, March 26–31, 1950, at the Floridian Hotel, Miami Beach, Florida. The theme of the meeting is THE AMERICAS UNITE TO SAVE SIGHT—A Mid-Century Conference on Progress.

SUNDAY, MARCH 26, 1950

1:00 P.M.	Registration and Viewing Exhibits
5:00 P.M.	Reception

MONDAY, MARCH 27, 1950

8:00 A.M.	Registration
9–12 Noon	General Assembly The Battle Against Blindness—Today and Tomorrow Testing Visual Fields by Flicker Fusion Rice Diet for Hypertension—Fundus Photographic Demonstration
12 Noon	Buffet Luncheon
2:00 P.M.	Recent Advances in Ocular Therapeutics New Opportunities in Teaching Ophthalmology Preventing Blindness in the Americas—Five-minute reports
8:00 P.M.	Business Meeting of the Pan-American Association of Ophthalmology

TUESDAY, MARCH 28, 1950

9:00 A.M.	Effects of Excessive Sunlight on the Eyes at High Altitudes and at Sea Level How Good Are Contact Lenses? SYMPOSIUM: Parasitic Diseases Hemispheric Control of Eye Infections

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12 Noon	Luncheon Meeting—Discovering the Antibiotics
2:00 P.M.	Teamwork for Prevention (Panel Discussion)
8:00 P.M.	Evening Entertainment

WEDNESDAY, MARCH 29, 1950

9:00 A.M.	Research in Testing Children's Vision Round Table on Industrial Eye Problems SYMPOSIUM: Trachoma
12 Noon	Luncheon Meeting
2:00 P.M.	Recent Advances in Military Ophthalmology Visual Acuity Standards for Military Forces and for Civil Service Personnel Eye Diseases in Infancy SYMPOSIUM: Blindness from Retrolental Fibroplasia in Premature Babies
7:00 P.M.	Buffet Dinner

THURSDAY, MARCH 30, 1950

9:00 A.M.	Transforming Individuals Through Cosmetic and Plastic Surgery SYMPOSIUM: Secondary Glaucoma Provocative Drinking Tests as an Indication for Surgery in Glaucoma Clinical Use of D.F.P. in Ophthalmology
12 Noon	Luncheon
2:00 P.M.	Protecting the Eyes of the School Child (Group Discussions) (a) Finding the Child with Eye Defects (b) Lighting the Classroom (c) The Partially Sighted Child
4:00 P.M.	Summary of Panel Discussions

FRIDAY, MARCH 31, 1950

A.M.	Research Program Actual Ocular Tension Legislation Regarding Prevention of Blindness

The Government Can't Do It All.—Under this title, Herbert Hoover recently discussed the place of private philanthropy in our democratic society, pointing out that "it is the voluntary institutions which are the spur to official progress." "Without them," said Mr. Hoover, who has spent many years in the field of philanthropy as well as of government, "our government healing and educational agencies would lag and degenerate." Mr. Hoover pointed out that the spirit of giving of one's self is a part of the content of all religions, and a part of our civilization. "The day when altruism in the individual dies for lack of opportunity for expression," he says, "it will die in the government. . . . We need charity in its real sense—from the heart."

In giving "from the heart," however, it is important for the individual to know something about the voluntary organizations who ask for his financial support. The National Information Bureau, Inc., performs the function of providing information on private agencies which are supported by public contributions. The Bureau is organized to investigate various national and international organizations soliciting funds, to answer inquiries from individuals and groups regarding their investigations, and is supported entirely by contribution memberships. Among the present members of the Bureau are representatives of 48 philanthropic foundations, 1200 local community chests or councils, chambers of commerce, business corporations, and nonprofit agencies. The Bureau in its latest edition of "Keep Faith With the Contributor," lists 11 basic standards in philanthropy and uses these standards in evaluating the organizations which it considers for inclusion among its approved list.

Cartoon on Eye Safety.—The December, 1949 *Safety Bulletin*, published by the Bureau of Employees' Compensation, Federal Security Agency, contains an eloquent full-page cartoon emphasizing individual eye hazards. It reads: "Goggles Off the Eye—Chips in the Eye—Fingers on the Eye—Goo'-Bye Eye."

The Efficacy of Gamma Globulin in the Prevention of German Measles.—The Subcommittee on Gamma Globulin of the Committee on Public Health of the Medical Society of the County of

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New York made a study of 320 children exposed to German measles in a large child-caring institution of New York City. Of these, 151 received gamma globulin and 169 served as controls. A total of 262 children was included in the study, 58 having been rejected for various reasons. The Committee, under the chairmanship of John F. Landon, M.D., included Murray Bass, M.D., Harold B. Davidson, M.D., Ralph Muckenfuss, M.D., and Franklin M. Foote, M.D., the National Society's executive director. The Committee concluded that "the evidence presented suggests that gamma globulin is of value in preventing German measles," but since some studies elsewhere are at variance with the evidence in this study, it is necessary to collect further evidence before final conclusions are warranted. Prevention of blindness workers are especially interested in studies of this kind in considering the problem of congenital eye defects which occur in children born of mothers who have had German measles during the first three months of their pregnancy.

Dr. Sheard Named to Tulane Lecture Post.—Announcement has been received that Dr. Charles Sheard, member of the National Society's Board of Directors, who has been the director of the Division of Physics and Biophysical Research of the Mayo Clinic and professor of Experimental Biophysics, the Mayo Foundation, Graduate School of the University of Minnesota, retired this fall under the provisions established by the Mayo Clinic and the University of Minnesota for the retirement of the professional staff. He was named professor of ophthalmic optics and will continue his supervision of the courses in opticianry at the Rochester Junior College. During the winter quarter, commencing December 1, Dr. Sheard took up his work as distinguished lecturer in ophthalmology of the Graduate School of Medicine of Tulane University in New Orleans, Louisiana. He will remain in residence in New Orleans, at least during the 1949–50 collegiate year.

Scholarship Awards Available.—The Delta Gamma Fraternity has a $1500 annual fund and a $2000 annual loan fund from which smaller scholarship awards are available for preparation of those intending to become (1) orthoptic technicians, (2) teachers of partially seeing children, or (3) specialists for blind preschool

children. Anyone wishing to specialize in one of these fields may be eligible for assistance, the amount in each case to be determined by the particular need and costs involved. Applicants for training in one of these fields should apply for a scholarship to Mrs. Thomas Johnson, 1235 Longfellow, Detroit 2, Michigan. Applications for scholarships for training starting in June should be filed by March 15, 1950; for training starting in the fall, by July 15.

Candidates are selected with the advice of a professional committee: Chairman, LeGrand H. Hardy, M.D., of the American Orthoptic Council; Mrs. Virginia Smith Boyce, Assistant Director, National Society for the Prevention of Blindness; Miss Ruth E. Lewis, Professor of Social Work, George Warren Brown School of Social Work, Washington University; Dr. Berthold Lowenfeld, Superintendent of the California School for the Blind, Berkeley, California; Miss Ruth B. McCoy, Assistant Director, New York State Commission for the Blind; and Lillian Ray Titcomb, M.D., President of Executive Committee, Nursery School for Visually Handicapped Children in Los Angeles.

Children and Moving Pictures.—The September, 1949 issue of *The Journal of The Royal Institute of Public Health and Hygiene* of Great Britain gives some noteworthy facts on children and moving pictures, from the "1949 Annual Report of Children's Entertainment Films." Of special interest is the statement that "pleasing patterns of light and shade and good picture composition give a sense of satisfaction to most children who all appear to like bright well-lit scenes, since they are easy to understand. Night scenes or dark pictures puzzle them and often fail to hold their attention. They enjoy color, but bright colors are apt to be overstimulating. Soft pastel shades often produce little 'ohs' and 'ahs' of satisfaction and are, therefore, preferable. Good camera-movements seem to satisfy their sense of rhythm, and one audience burst into applause following a long 'pan' by a camera." The note calls attention to the fact that children often find a scene difficult to understand quickly, and therefore it must be left on the screen long enough for them to absorb it. It states further, "Long shots are puzzling to children, because if there are many objects on the screen, they do not find it easy to pick out the ones essential to the

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story, and these scenes have to be carefully constructed so as not to include too many objects capable of diverting attention. On the other hand, they find close-ups easily understandable and absorbingly interesting, and that is why a children's picture must have more of them than an adult's picture."

Medical Opinion Needed Before Contact Lenses are Worn.—Contact lens wearers would do well to obtain medical opinion before attempting to wear the lenses, points out Marguerite Shields, Chicago, of the American Medical Association bureau of press relations, in the October issue of *Hygeia*. The new "waterless" type of contact lens, according to the producers, is "solutionless, medically correct, and safe." Describing the lenses, an American Medical Association exhibit list says: "The patient's tears form the necessary fluid lens, thereby eliminating the difficulties caused by artificial buffer solutions. The new lens can be worn over long continuous periods with comfort."

Study by ophthalmologists will be required, however, before the new lenses become generally available, if ever, the article advises. "At present they are an encouraging development, but would-be contact lens wearers would do well to remember the recommendation of the American Committee on Optics and Visual Physiology that medical opinion should be secured in every case before contact lenses are prescribed."

Leslie Dana Award.—Conrad Berens, M.D., vice-president of the National Society, received the 1949 Leslie Dana Gold Medal in recognition of his outstanding work in prevention of blindness and sight conservation. The presentation was made on October 15, 1949 by Walter Lancaster, M.D., on behalf of the St. Louis Society for the Blind, the Association for Research in Ophthalmology, and the Society, which was represented by Franklin M. Foote, M.D., as moderator. Among those at the meeting to congratulate the recipient were Moacyr Alvaro, M.D., of São Paulo, Brazil, and Sir Stewart Duke-Elder of London.

American Foundation Appoints New Executive.—Announcement has been received of the appointment of M. Robert Barnett, former executive director of the Florida Council for the Blind, to

replace Dr. Robert B. Irwin as executive director of the American Foundation for the Blind. Dr. Irwin is continuing his activities as associate director of the American Foundation for Overseas Blind.

The Mark J. Schoenberg Memorial Lecture.—The Mark J. Schoenberg Memorial Lecture was given at the New York Academy of Medicine at 8:30 P.M., Monday, December 5, under the joint sponsorship of the New York Society for Clinical Ophthalmology and the National Society for the Prevention of Blindness. Jonas S. Friedenwald, M.D., of Baltimore, Maryland, discussed "Some Problems in the Diagnosis and Treatment of Glaucoma." This annual lectureship was established as a memorial to Dr. Schoenberg, whose interest and original work in the control of glaucoma laid the foundation for the national fight against this disease as a cause of blindness.

The committee in charge of arrangements for the meeting was composed of Willis S. Knighton, M.D., Chairman; Isadore Givner, M.D.; James W. Smith, M.D.; and Franklin M. Foote, M.D.

Recent Research Grants.—Among recent grants for research by National Institutes of Health are $5,189 to Dr. John S. Lockwood of Columbia University for studies on lysozyme in ulcerative disease; $9,914 to Dr. Paul A. Bunn of Syracuse University to determine the advantage of using the rabbit's eye as a tissue to study antibacterial activity of tuberculostatic agents; $10,000 to Dr. Severo Ochoa of New York University for study of enzyme systems involved in biologic oxidations and syntheses.

Staff Changes.—The National Society for the Prevention of Blindness announces the appointment of two new staff members: Robert S. Krueger, as director of industrial service, and John L. Fortson, as director of public relations. Mr. Krueger has worked for a number of years on problems of vision in industry and was formerly head of the safety department of the Pratt & Whitney Aircraft Corporation. Mr. Fortson was formerly with the radio-television department of N. W. Ayer & Son, and for a number of years was director of public relations for the Federal Council of Churches.

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Mrs. Virginia Smith Boyce, formerly administrative assistant of the Society, has been made assistant director, and Mrs. Grace Hooper was appointed as business manager.

The Society announces with regret the resignation of Charles P. Tolman, consulting engineer, and the retirement of Mrs. Helen Bennett Smith, for many years the able office manager of the Society.

Clarence O. Sappington, M.D., Dr. P. H.—The National Society for the Prevention of Blindness and THE SIGHT-SAVING REVIEW have lost a most valued friend in the death of Dr. Sappington who has served not only as a member of the Society's Industrial Advisory Committee, but was on the Board of Editors of the REVIEW for 18 years. Dr. Sappington was a recognized authority in the field of industrial hygiene, serving in the past as director of the Division of Industrial Health of the National Safety Council and more recently as the editor of *Industrial Medicine and Surgery*, the journal of medicine in industry.

Current Articles of Interest

Ocular Findings in Three Hundred and Twenty-three Patients with Schizophrenia, Martin Cohen, M.D., *Archives of Ophthalmology*, June, 1949, Vol. 41, No. 6, pp. 697–700, published monthly by American Medical Association, 535 North Dearborn Street, Chicago 10, Illinois.

A preliminary report is presented on ocular findings in cases of schizophrenia. In New York's 20 state hospitals for the mentally ill, where the average total number of patients is 85,000, 25 per cent are schizophrenic. The present study was prompted by the prevalence and gravity of the disease, the absence of recent reports on ocular findings, and the lack of micropathologic descriptions of the optic disk in schizophrenic patients. Results showed that in 100 patients (31 per cent) the color of the disks was normal; and in 223 patients (69 per cent) there was either a pronounced temporal or a diffuse discoloration of the optic disk. The author indicates that this discoloration may be due to a degenerative, inflammatory, vascular, metabolic or toxic process affecting the nerve head; and that neuropathologic examination of the disk might serve to clarify the underlying cause of the discoloration. In conclusion, Dr. Cohen states that the ophthalmologic manifestations and clinical findings suggest the probable existence of a pathologic process affecting the visual pathway in the brain of schizophrenic patients.

Personality Patterns in Ocular Discomfort, Wayne W. Wong, M.D., *Archives of Ophthalmology*, October, 1949, Vol. 42, No. 4, pp. 443–450, published monthly by the American Medical Association, 535 North Dearborn Street, Chicago 10, Illinois.

The author points out that emotional upset from a love affair or a new job may cause eye discomforts and that extreme sensitivity to light and pain in the eyes and inability to use eyes for close work such as reading or sewing, even for short periods, are characteristic symptoms of ocular neurosis. To quote in part: "Such patients tend to be of a definite physical type. Women predominate over men.

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In general, these patients are slenderly built. They dress neatly and well despite their actual economic station. Their habits and actions are orderly and well planned. They are endowed with a great deal of energy and 'push' and appear tireless in their pursuit of the goal that 'everything be just so.'

"This inflexibility reflects itself in their actions and thinking. Rather than adapt themselves to a difficult situation in life, they resist and balk, at the expense of their emotional system.

"These patients usually have a low refractive error. They will be found to be hypermetropic (farsighted). Their visual acuity is 20/20 without glasses. Lenses give only temporary relief, after which the patient feels better without them."

Many people may be wearing glasses who need treatment for the underlying emotional cause of their disturbance of vision, Dr. Wong's study indicates. In one community in which 1,000 consecutive single vision prescriptions of a moderate-sized optical house were reviewed, it was found that approximately 20 per cent of the lenses were worn by patients "whose benefit cannot be attributed to the optical effect of the lenses alone."

In conclusion, he says, "Persons with ocular discomfort of non-organic nature have personality characteristics of a definite pattern. Relief of their symptoms consists in helping them to understand their emotional background and directing their energies into less conflicting channels."

Psychosomatic Phenomena in Ophthalmology, Edward Hartmann, M.D., *The British Journal of Ophthalmology,* August, 1949, Vol. XXXIII, No. 8, pp. 461–476, published monthly by the British Journal of Ophthalmology, Ltd., 24, Thayer Street, London, W. I., England.

Psychosomatic symptoms are often mediated through the vegetative nervous system, which has an important rôle in the eye. Secondly, the eye has a high symbolic value which frequently makes it the site of conversion symptoms. For these reasons, Dr. Hartmann stresses the importance of understanding psychosomatic phenomena in ophthalmology. He describes the psychic disturbances which produce visual symptoms and the ocular diseases which may be either started or aggravated by psychical

factors. Among these are: glaucoma; spasms of the retinal arteries; retinal hemorrhages or exudates; squint; muscular imbalance; heterophoria; vergence insufficiency; blinking tic; and allergies. The rôle of psychosomatic phenomena in chronic diseases such as diabetes and tuberculosis is also discussed, and numerous case studies are presented. While serious cases must be referred to a psychiatrist, the many milder ones become the responsibility of the ophthalmologist, who must be on the alert for psychosomatic disturbances in his patients.

Medical Resurvey of Nutrition in Newfoundland, 1948, W. R. Aykroyd, M.D. *et al.*, *The Canadian Medical Association Journal*, April, 1949, Vol. 60, No. 4, pp. 329–352, published monthly by The Canadian Medical Association, 3640 University Street, Montreal, Canada.

This 1948 resurvey evaluates the effect on health in Newfoundland of government measures to improve nutrition, undertaken after a nutrition survey in 1944. Concerning the eyes, the recorded prevalence of thickening of the conjunctiva in 402 Newfoundland school children in 1944 was compared with that of some 300 Minnesota children. Prevalence in Newfoundland was over 70 per cent and in Minnesota, only 4 per cent. Although the causes are unknown, a significant correlation was demonstrated between serum vitamin A levels and this lesion. Improvement in Newfoundland is evident from the statistically important change in frequency of occurrence between 1944 and 1948. Improvement is also evident between 1944 and 1948 in the prevalence of circumcorneal hyperemia and blepharitis. Some evidence that trauma from excessive glare contributes to producing blepharitis was obtained. Its prevalence in 1944 was 37 per cent in a village where the light intensity was higher than elsewhere—this in contrast to the prevalence for all outports taken together, which was 27.3 per cent. Still the prevalence in this village decreased to 26.6 per cent in 1948, suggesting that improved nutrition had reduced susceptibility to glare. In summary, the authors state that those signs and symptoms of malnutrition which could have been expected to decrease as a result of fortifying margarine with vitamin A and enriching flour with riboflavin, niacin and thiamine were less frequently encountered in 1948 than in 1944.

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Microphthalmos and Anophthalmos with or without Coincident Oligophrenia, A Clinical and Genetic Statistical Study, Torsten Sjogren, M.D., and Tage Larsson, M.D., June, 1949, The Psychiatric Clinic of Karolinska Institutet, Stockholm, Sweden.

This important study revealed that of 137 cases of microphthalmos or anophthalmos with blindness in Sweden, 58 are combined with oligophrenia. The findings indicated that the combination of anophthalmos or microphthalmos and oligophrenia (MO) must be a homogeneous form of disease or that it must be a question of a very strong linkage.

The authors point out that a special investigation showed the incidence of blind children in Sweden who have reached school age (7 years) to be 0.31 per thousand. The incidence of microphthalmos-oligophrenia is 0.012 per thousand and of isolated microphthalmos (Mi) 0.013 per thousand. Each disease is responsible for 4 per cent of the cases of blindness that reach school age. They state further:

"The occurrence of bilateral or unilateral anophthalmos is 17 per cent in the [anophthalmos or microphthalmos with oligophrenia] MO material and 11 per cent in the [microphthalmos] Mi material. Other diseases of the eyes occur to a considerable extent among MO cases—cataract in 24 per cent, coloboma in 19 per cent —and to a much smaller extent among the Mi cases. German measles in the mother during pregnancy cannot possibly explain more than a relatively small number of the isolated cases of MO and Mi.

"The morbidity risk of [anophthalmos or microphthalmos with oligophrenia] MO is about 9 ± 3 per cent for the sibs of the MO cases. The only uniform mode of inheritance that is plausible in MO is a partially sex-linked mode with a reduced degree of manifestation. It is not possible to rule out that there are separate forms of inheritance so that the inheritance in certain families is totally sex-linked recessive and that otherwise it can be a question both of a partially sex-linked recessive mode of inheritance and mutations with a dominant appearance. Microphthalmos occurs to a certain extent as a dominant hereditary disease. Only isolated cases of microphthalmos are found with the parent mating unaffected with unaffected. The material indicates a low degree of manifestation."

Retrolental Fibroplasia in Prematurely Born Children, Anita Peek Gilger, M.D., *American Journal of Ophthalmology*, July, 1949, Vol. 32, No. 7, pp. 917–929, published monthly by the Ophthalmic Publishing Company, 664 North Michigan Avenue, Chicago 11, Illinois.

Dr. Gilger reports on a 5-year survey, made in Cincinnati, of retrolental fibroplasia in 229 prematurely born children weighing less than 2,268 gm. at birth. Her findings indicate that no cases of retrolental fibroplasia were found among infants weighing more than 1,814 gm. at birth. In 96 cases with birth weights of 1,814 gm. or less, 7 cases, or 7.3 per cent, were found to have retrolental fibroplasia. The predominance of boys over girls among the infants affected with retrolental fibroplasia was statistically significant.

Additional factors considered by the author in the etiology of retrolental fibroplasia were: uterine bleeding during pregnancy; age and parity of the mother at delivery; occurrence of virus infections or chronic illness during pregnancy; cause of premature onset of labor; race; associated intracranial disease; administration of vitamin A in early postnatal life; and other factors in early postnatal management and course. The difference in the influence of these latter factors in affected and nonaffected prematures was not sufficient to be statistically significant and, therefore, retrolental fibroplasia in this series cannot be attributed to them.

The Present Status of Corneal Grafting, John M. McLean, M.D., *The Pennsylvania Medical Journal*, June, 1949, Vol. 52, No. 9, pp. 929–931, published monthly by The Medical Society of the State of Pennsylvania, 230 State Street, Harrisburg, Pennsylvania.

Dr. McLean discusses types of cases which can be benefited by corneal transplantation; other available procedures which give adequate improvement with less risk; available techniques when transplantation is in order; and results to be expected. Among the cases benefited by corneal transplantation are corneas without opacity or vascularization (conical corneas); central corneal opacities which may be completely excised and replaced; larger corneal opacities where enough clear cornea remains to place a transplant in contact with normal cornea for at least half of its area; and such cases as healed interstitial keratitis.

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Book Review

BINOCULAR IMBALANCE. Emmanuel Krimsky. Philadelphia: Lea & Febiger, 1948, 464 p.

In this volume the author has treated his subject matter, that of disturbances in binocular vision, from a standpoint quite different from the usual book on the disturbances of the muscles of the eye. In reading the book, one is very much aware of Krimsky's ideas and thoughts relative to pathology of the ocular muscles; also of his outstanding personal ingenuity when considering instrumentation and details in the technique of examination.

The Preface of the book points out that the author recognizes the two schools of thought regarding the treatment of muscular imbalance: the "muscle" school and the "psychological" school; and that since neither in itself is curative in all cases, both should be considered in relation to each individual muscle-imbalance patient. He selected the title, *Binocular Imbalance*, because, to quote the Preface, "the attention of the reader is thereby focused on the all-inclusive problem rather than just on ocular muscle pathology, which accounts for but a small percentage of cases of binocular dysfunction. The major binocular problems deal with symptoms referable to the use of the eyes, especially for occupational or vocational needs. In not a few cases one finds headaches or questionable eyestrain attributed to eye muscle weakness without a careful critical examination or analysis of the ocular problem or the systemic or extraneous factors."

To quote further from the Preface, "This book represents in large measure an effort to demonstrate the scientific and clinical value of the corneal light reflex in interpreting objectively and subjectively the state of binocular imbalance. The value of the instruments which the author describes are of secondary importance to the masterful use of an ordinary flashlight and prism in diagnosis."

Attention is also called in the Preface to the fact that although for many years others have noted the corneal light reflex, the author

is able, through use of his prism-reflex test, to shift this light reflex artificially, at will, in order to obtain useful clinical information.

The book is subdivided into eighteen chapters. The general subjects of each chapter are as follows: The Corneal Light Reflex; Ocular Fixation; Positions of Gaze; Ocular Movements; Normal and Abnormal Physiology; The Phorias; Prisms; The Maddox Rod; Image Responses, Normal and Abnormal; Further Consideration of Binocular Examination; Horizontal Binocular Imbalance; Vertical Imbalance; Relevant Neurophysiology; Squint; Miscellaneous Considerations; Prisms in the Treatment of Binocular Imbalance; The Stereoscope; and The Surgical Management of Binocular Imbalance.

There are three outstanding attributes of this book which make it quite individual. The first is the author's prism reflex technique and its many applications as he outlines it. The second is the anglometer, and its utilization. The third is Krimsky's stereoscope and the great extent to which he uses stereoscopes, his stereoscope as well as others', in the study of binocular imbalance.

The book work is excellent. Illustrations are adequate and almost universally good. The author has been meticulous and detailed in his references.

This book is to be considered as a valuable addition to the matter of the ocular muscles.

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